COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF SHELBY ENERGY COOPERATIVE, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR ITS 2010 ~ 2014 CONSTRUCTION WORK PLAN	**)** **)** **)** **)**	**CASE NO. 2010-00244**

RESPONSE OF

SHELBY ENERGY COOPERATIVE, INC. ("SEC") TO THE

"SECOND INFORMATION REQUEST OF COMMISSION STAFF TO SHELBY ENERGY COOP, INC."

FOR COMMISSION'S ORDER 2010-00244

DATED DECEMBER 15, 2010

FILED: DECEMBER 27, 2010

The Witness for All Response Contained Hereinafter:

Gary Grubbs, P.E.

SEC/P&D Engineers, Inc.

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QUESTION 1: *Refer to Exhibit B filed on October 29, 2010 in response to Commission Staffs First Data Request.*

QUESTION 1a**:** *Explain and provide all supporting calculations of each cost and savings associated with the conversion to Automated Metering Infrastructure meter reading and each cost associated with existing contract meter reading.*

RESPONSE 1a: It should be stated first that Exhibit B was developed as a break-even / sensitivity tool and the inputs may not necessarily reflect exact past, present or expected future values. Said input values are selected to produce a conservative analysis and then reviewed via the analysis program as to the sensitivity of said selected variables on the project breakeven timing. Following are the explanations of each cost and savings associated with the conversion to Automated Metering Infrastructure meter reading (Note that many of the input variables may be rounded off from what is actually used in the calculations, spread over multiple years, and altered by growth, inflation and present value ("PV") factors):

{Instructions: Lower case letters preceded by numbers indicate cells from within the Exhibit B spreadsheet (i.e. (b5)); uppercase letters indicate the "costs" or "savings" section from within the Exhibit B spreadsheet (i.e. (C)). The sections (i.e. A, B, etc) below correspond to the "Lettered" cost and savings calculations indicated on Exhibit B.}

A. *"Cost to Replace Existing Meters with AMR Meters"* ~ this is the purchase of the AMI meters plus all of the costs of replacing the existing meters with the AMI meters. Using Exhibit B this would be represented basically as: (7b)(12b) + (8b)(13b) + ((b7 + b8)(b43 + b44))

B. ***"Cost of AMI (TWACS & Sub Make-Ready)"*** **~ this is the cost of substation AMI and communication equipment. Using Exhibit B this would be represented basically as: $677,580 + (b45) + (b46) where "$677,580" is the substation AMI cost.**

C. ***"Cost to Install AMR Meters for New Members"*** **~ this is the PV of 15 years worth of AMI meters installed on the yearly new members. Using Exhibit B this would be represented basically as: PV of (b11)(b12) per year and inflated yearly by (b5).**

D. ***"Cost of Operation and Maintenance (O&M) Expenses"*** **~ this is the O&M cost of the new AMI. Using Exhibit B this is calculated basically as: PV of (A+B+C)(b3) per year.**

E. ***"Cost of Annual Fixed Charges of AMR Equipment"*** **~ this is the Fixed Charge cost of the new AMI. Using Exhibit B this is calculated basically as: PV of (A+B+C)(b2) per year.**

F. ***"Cost of Annual Licensing and Maintenance Fee"*** **~ this is the *licensing and maintenance fee for the new AMI.* Using Exhibit B this is calculated basically as: PV of (b42) per year.**

G. ***"Cost to Manual Read Meters Until AMR is Operational"*** **~ this is the cost to manually read the meters until the AMI is functional. Using Exhibit B this is calculated basically as: (129,167)(b9) + (b41)(.74) where ".74" is the fraction of a year that manual meter reading is expected for power meters and "129,167" is the number of manual kWh meter readings expected.**

H. ***"Cost for One Additional Metering Tech"*** **~ this is the cost of one additional metering tech to support the AMI. Using Exhibit B this is calculated basically as: PV of (b20) grown by (b10) per year.**

I. *"Savings from Reduction of High Bill Complaints"* ~ this is the savings expected from a reduction in high bill complaints brought about by AMI. Using Exhibit B this is calculated basically as: PV of (b7)(b31)(b33)(b32) per year. SEC E&O staff discussion yielded (b31), (b32) and (b33).

J. *"Savings from Reduction of Stopped Meters"* ~ this is the savings expected from a reduction in repair of "stopped" meters. Using Exhibit B this is calculated basically as: PV of (b28)(b29)(b7) per year. SEC E&O staff discussion yielded (b28) and (b29).

K. *"Savings from Avoidable KWH Energy Theft"* ~ this is the savings expected from a reduction in energy theft. Using Exhibit B this is calculated basically as: PV of (b17)(b27) per year. SEC E&O staff discussion yielded (b27).

L. *"Savings from Avoidable Damaged Transformers"* ~ this is the savings expected from a reduction in damaged transformers from over-loads. Using Exhibit B this is calculated basically as: PV of (b25)(b26) per year. SEC E&O staff discussion yielded (b25) and (b26).

M. *"Savings from Soft Disconnects / Reconnects"* ~ this is the savings expected from a reduction in certain site visits for disconnects and reconnects. Using Exhibit B this is calculated basically as: PV of (b23)(b24)(b7) per year. SEC E&O staff discussion yielded (b23) and (b24).

N. *"Savings from Avoidable Meter Re-Reads"* ~ this is the savings expected from a reduction in required meter re-reads. Using

Exhibit B this is calculated basically as: PV of (b21)(b22)(b7) per year. SEC E&O staff discussion yielded (b21) and (b22).

O. ***"Savings from Reduction of Line Losses (Ph Balancing)"*** **~ this is the savings expected from a reduction in line losses due to the ability for easier / better phase balancing. Using Exhibit B this is calculated basically as: PV of (b17)(b47) per year. SEC E&O staff discussion yielded (b47).**

P. ***"Savings from End of Line PSC Voltage Recordings"*** **~ this is the savings expected from a reduction in expenses incurred in obtaining end-of-line voltage reading for the PSC and RUS. Using Exhibit B this is calculated basically as: PV of (b37) per year. SEC E&O staff discussion yielded (b37).**

Q. ***"Savings from Improved Outage Management"*** **~ this is the savings expected from improved outage management. Using Exhibit B this is calculated basically as: PV of (b16) per year. SEC E&O staff discussion yielded (b16).**

R. ***"Savings from not Admin. Contract Meter Reading"*** **~ this is the savings expected from not having contract meter reading administration. Using Exhibit B this is calculated basically as: PV of (b18) per year. SEC E&O staff discussion yielded (b18).**

S. ***"Savings from Reduction in "No-Voltage" Calls"*** **~ this is the savings expected from not having to respond to as many consumer "no-voltage" calls. Using Exhibit B this is calculated basically as: PV of (b38)(b39) per year. SEC E&O staff discussion yielded (b38) and (b39).**

T. ***"Mechanical Meter Replacement (5% year)"*** **~ this is the cost for having to replace 5% of the aged mechanical meters per year. Using Exhibit B this is calculated basically as: PV of ((b7) + (b8))(b14)(0.05) per year. SEC E&O staff discussion yielded (b14) and (0.05).**

U. ***"Cost of Meters for New Members"*** **~ this is the cost expected for meters for new members. Using Exhibit B this is calculated basically as: PV of (b11)(b14) per year. SEC E&O staff discussion yielded (b11).**

V. ***"Cost of (O&M) Operation and Maintenance Expenses"*** **~ this is the cost expected for meter O&M if remaining with existing mechanical meters. Using Exhibit B this is calculated basically as: PV of (b36 + T + U)(b4) per year.**

W. ***"Cost of Annual Fixed Charges of Metering Equipment"*** **~ this is the cost expected for meter facility charges if remaining with existing mechanical meters. Using Exhibit B this is calculated basically as: PV of (T + U)(b2) per year.**

X. ***"Cost to Read Large Commercial Meters"*** **~ this is the cost for continuing to manual read the large power meters. Using Exhibit B this is calculated basically as: PV of (b41) per year.**

Y. ***"Cost to Read Residential & Commercial Meters"*** **~ this is the cost for continuing to manual read residential and commercial meters. Using Exhibit B this is calculated basically as: PV of (b7+b8)(b9)(12) per year.**

QUESTION 1b: *Explain how the present worth rate of six percent was determined.*

RESPONSE 1b: For typical investments, with costs concentrated in early periods and benefits following in later periods, raising the discount rate tends to reduce the net present value. The annualized US inflation rate for the most recent 10 year period is 2.47%. Present Worth ("PW") rates of 4%, 6% and 8% were used in the sensitivity analysis; breakeven results obtained were 5.0 years, 5.1 years and 5.3 years respectfully. The 6% PW rate was thus selected based on our conservative criteria.

QUESTION 1c: *Explain how the annual fixed charge of 13.85 percent was determined.*

RESPONSE 1c: The Fixed Charge Rate ("FCR") is also frequently referred to as Carrying Charge. It is made up of components that comprise the annual cost associated with an investment. As outlined in RUS Bulletin 1724D-104, section 4.2; components typically considered when calculating the FCR include:

- **Cost of Capital**
- **Taxes**
- **Depreciation**
- **Operations**
- **Maintenance**

The Fixed Charge Rate can vary significantly based upon various economic conditions. Please refer to Exhibit A of this response to review the calculation of SEC's current overall FCR. The rationale to use an FCR of 13.85% for the AMI evaluation instead of the overall calculated value of 14.45% was based upon the fact that the O&M portion of the FCR is less for metering projects than the overall calculated O&M of 5.83% as calculated in Exhibit A.

QUESTION 1d: *Explain the reason for the difference in the operation and maintenance cost rate of one percent for the AMR Meters and two percent for the Mechanical Meters.*

RESPONSE 1d: The historical O&M charge for the existing mechanical meters is estimated to be 3% and the anticipated O&M charge for the new electronic meters is 0.5% based on review of reported industry-wide actual experience. The difference in O&M rates between the mechanical and the electronic meters is based upon age, technology and repairs made to the metering installations at the time of AMI meter installation. The O&M rates of 2% and 1% respectfully were used in the breakeven analysis based on our conservative criteria as the use of the actual estimated rates of 3% and 0.5% respectfully resulted in a breakeven period of 4.0 years.

QUESTION 1e: *Explain the reason for the difference in the inflation rate of one percent for AMR Meters and three percent for the Mechanical Meters.*

RESPONSE 1e: The use of 1% for AMR Meters was an error as we intended to use 3% for both the AMR Meters and Mechanical Meters. The erroneous 1% occurred due to not replacing it with 3% after conducting its sensitivity study; refer to Exhibit B of this response for the corrected breakeven output. Please note that the inflation rate has very little effect on the breakeven point (numerically it changed from 5.13 years for the incorrect 1% to 5.14 years for the intended 3%).

QUESTION 1f: *Explain the rationale for using 15 years as an evaluation period.*

RESPONSE 1f: Industry research indicates the use of between 15 ~ 25 years is a reasonable range to use as an evaluation period when conducting AMI studies. We feel confident that our selection of Aclara's TWACS provides an AMI platform that meets the technology needs required of a system well into the future. If a time is reached that other technologies need to be evaluated then the evaluation of such must stand on its own as a cost effective replacement for TWACS AMI. Please refer to Exhibit C of this response as one sample of what other utilities have stated in regard to the life span of selected AMI platforms.

CALCULATE FIXED CHARGE RATE FACTORS

NOTES: If FCR factors are known, then go directly to Worksheet "INPUT"
Enter data in the shaded (yellow) cells only.

ENTER the following amounts from the most recent RUS Form 7.

A	53,169,212	NET UTILITY PLANT	Part C, Line 5
B	26,649,525	TOTAL MARGINS & EQUITIES	Part C, Line 35
C	33,826,163	TOTAL LONG-TERM DEBT	Part C, Line 42
D	1,332,167	DISTRIBUTION EXPENSE - OPER.	Part A, Line 5 *(b)*
E	1,766,853	DISTRIBUTION EXPENSE - MAINT.	Part A, Line 6 *(b)*
F	1,855,080	DEPRECIATION & AMORT. EXPENSE	Part A, Line 12 *(b)*
G	0	TAX EXPENSE - PROPERTY	Part A, Line 13 *(b)*
H	34,070	TAX EXPENSE - OTHER	Part A, Line 14 *(b)*

ENTER the following construction loan data.

Loan Source	Interest Rate	% of Total
RUS	4.56	45.23
CFC	6.36	10.55
Other	4.78	44.22
Other		

J 4.85 Blended Interest Rate (%)

COST OF EQUITY FACTOR

K	35.0	ENTER the Capital Retirement Cycle. (Number of Years)
L	0.04	ENTER Utility Plant Growth Rate. (Format: 0.XX)
M	5.357732237	Calculated Cost of Equity Factor (%) (Goodwin Formula)

$$\mathbf{M} = \frac{(1+\mathbf{L})^{(\mathbf{K}+1)} - (1+\mathbf{L})^{\mathbf{K}}}{(1+\mathbf{L})^{\mathbf{K}} - 1} \times \mathbf{100}$$

FIXED CHARGE RATE FACTORS

2.71	Cost of Debt (%)	= (**C** / (**B**+**C**)) x **J**
2.36	Cost of Equity (%)	= (**B** / (**B**+**C**)) x **M**
5.07	**TOTAL COST OF CAPITAL (%)** (= Cost of Debt + Cost of Equity)	
0.06	**TAX RATE (%)**	= ((**G** + **H**) / **A**) x **100**
3.49	**DEPRECIATION RATE (%)**	= (**F** / **A**) x **100**
5.83	**OPERATIONS and MAINTENANCE RATE (%)**	= ((**D** + **E**) / **A**) x **100**
14.45	**FIXED CHARGE RATE (%)** (Sum of the above)	

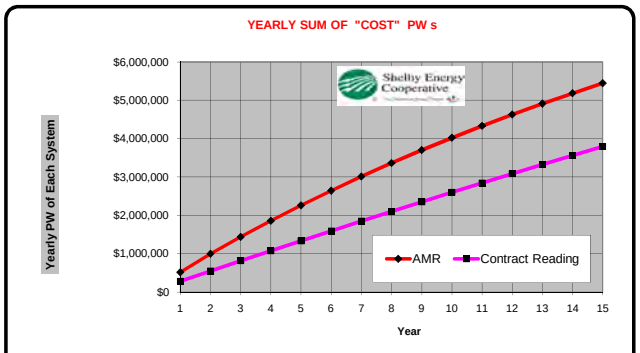
EXHIBIT A

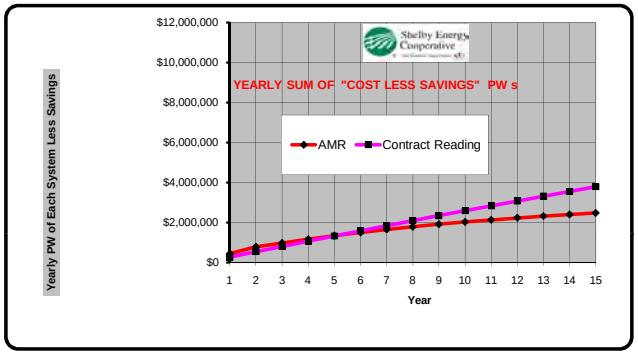
Shelby Energy AMI Breakeven Analysis (revised 12/23/2010)

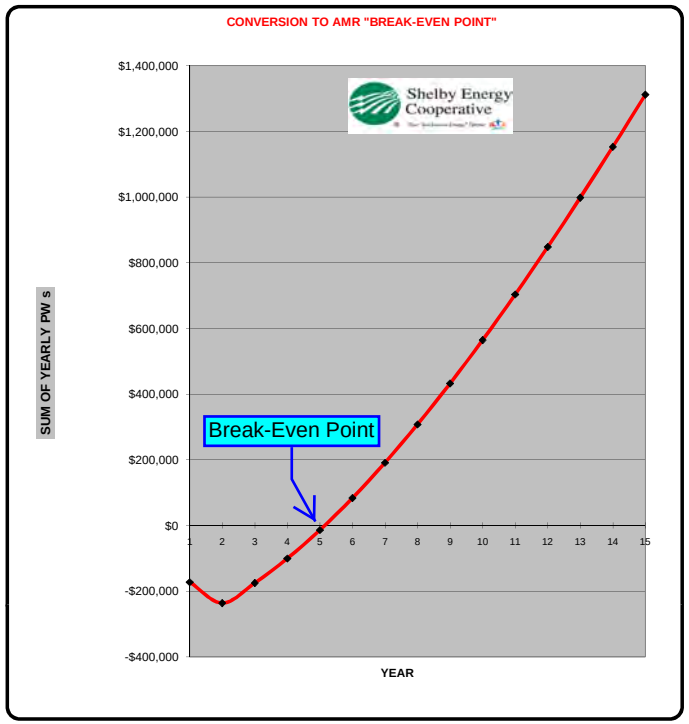
Row # to correspond with responses 1aA ~ 1aY

Column # to correspond with responses 1aA ~ 1aY

	A	B	C
1	Present Worth Rate (%)	6.00%	year
2	Annual Fixed Charge (%)	13.85%	year
3	O & M Costs ~ AMR Meters (%)	1.00%	year
4	O & M Costs ~ Mechanical Meters(%)	2.00%	year
5	Inflation Rate ~ AMR Meters(%)	3.00%	year
6	Inflation Rate ~ Mechanical Meters(%)	3.00%	year
7	Meters ~ Residential	15,000	2008
8	Meters ~ Small Commercial	500	2008
9	Meter Reading Cost per Month per Meter	[redacted]	each
10	Inflation Rate ~ SEC Labor	4%	year
11	Growth in Meters	250	year
12	AMR Meter Cost ~ Residential (Avg)	[redacted]	each
13	AMR Meter Cost ~ Commercial (Avg)	[redacted]	each
14	Mechanical Meter Cost (Avg)	$38	each
15	Energy Cost ($/KWH)	$0.06	each
16	Cost Reduction from Improved Outage Mgmt.	$9,000	year
17	Annual Power Cost (energy only) (2008)	$21,500,000	year
18	Cost to Oversee Contract Meter Reading	$7,500	year
19	Energy Rate Increase (%)	3.00%	year
20	Additional Meter Tech for AMR	$60,000	year
21	Meter Re-Reads (%)	1.70%	year
22	Contract Cost per Re-Read	[redacted]	each
23	Soft Disconnects / Reconnects (% of Meters)	5.00%	year
24	Contract Cost per Disconnect or Reconnect	[redacted]	each
25	Transformers with Avoided OL Damage	10	year
26	Cost of Replacing Failed Transformer	$1,000	each
27	Line Loss due to Theft Deterrent (%)	0.30%	year
28	"Stopped" Meters (%)	0.35%	year
29	Cost to Replace & Bill for "Stopped" Meter	$70.00	each
30	Inflation Rate ~ Contract Labor	2.40%	year
31	High-Bill Complaints (%)	3.00%	year
32	Cost of High-Bill Complaint Investigation (Avg)	$200	each
33	Reduction in High-Bill Complaints (%)	50%	year
34	Voltage-Check Service Orders	50	year
35	Cost of Voltage-Check Service Order	$200	each
36	Net Meter Plant (2007)	$1,460,664	net
37	Cost Reduction of Eliminating PSC Voltage Rec.	$2,000	year
38	No-Voltage Service Calls (No Problem Found)	60	year
39	Cost of No-Voltage Service Call	$200	each
40	Reduction in No-Voltage Service Calls	70%	year
41	Cost to Read 49 Large Power Meters	$6,000	year
42	AMR License Fee (AVG)	[redacted]	year
43	Cost to Replace Existing Meter With AMR Meter	$12	each
44	Cost Associated with Meter Replacement	$2.00	each
45	Cost for Sub Communication	$55,200	10 Subs
46	Cost for Sub Make-Ready (Labor & Material)	$55,510	10 Subs
47	Reduction of Line Losses for Ph Balancing, etc	0.30%	year
48	Evaluation Period	15	years
49	Beginning Year	2010	







SUM OF COSTS & SAVINGS ASSOCIATED WITH CONVERSION TO AMR METER READING

Cost to Replace Meters with AMR Meters	Cost of AMI (TWACS & Sub Make-Ready)	Cost to Install AMR Meters for New Members	Cost of O&M Expenses	Cost of Annual Fixed Charges of AMR Equipment	Cost of Annual License & Maintenance Fees	Cost to Read Meters Until AMR is Operational	Cost for One Additional Metering Tech	Savings from Reduction of High Bill Complaints	Savings from Reduction of Stopped Meters	Savings from Avoidable KWH Energy Theft	Savings from Reduction in "No-Voltage" Calls
[redacted]	$788,290	[redacted]	$431,831	[redacted]	[redacted]	[redacted]	$1,201,415	$999,966	$81,664	$1,170,391	$228,158

SUM OF COSTS & SAVINGS ASSOCIATED WITH CONVERSION TO AMR METER READING (continued)

Savings from Avoidable Damaged Transformers	Savings from Soft Disconnects & Reconnects	Savings from Avoidable Meter Re-Reads	Savings from Reduction of Line Loss (Ph Balancing)	Savings from End of Line PSC Voltage Recordings	Savings from Improved Outage Management	Savings from not Admin. Contract Meter Reading	Costs	Savings		Total Annual Costs of AMR less Savings	Present Worth of Total Annual Costs
$190,132	$420,383	$95,287	$1,101,429	$38,026	$171,119	$142,599	$8,029,175	$4,639,154		$3,390,021	$2,479,252

SUM OF COSTS ASSOCIATED WITH EXISTING CONTRACT METER READING

Mechanical Meter Replacement (5% Year)	Cost of Meters for New Members Installations	Cost of O&M Expenses	Cost of Annual Fixed Charges of Metering Equipment	Cost to Read Large Commercial Meters	Cost to Read Residential & Commercial Meters					Total Annual Costs of Existing Meter Reading	Present Worth of Total Annual Costs
$547,738	$176,690	$431,553	$747,487	$120,142	[redacted]					[redacted]	[redacted]

EXHIBIT B

Meter Readers Near End of Road

Russell Aragon recently sprinted from meter to meter in the Stratmoor Hills neighborhood, avoiding yapping dogs, navigating messy yards and slipping through gates that hardly deserve the name.

The Colorado Springs Utilities meter reader, a five-year veteran, relishes the challenges of "getting the read." He can read 600 meters in five hours -- 10,000 to 12,000 meters a month -- with more than 99.5 percent accuracy.

"I walk fast, and I read fast, too," said the personable Aragon, who despite his hustle takes time to chat with lonely elderly people on his route and pet the dogs that have proved themselves friendly.

Still, Aragon, 45, knows he's a walking anachronism. The small, gray boxes recently installed on gas meters in Stratmoor Hills tell him so.

The boxes are electronic modules capable of transmitting meter readings back to the utility instantaneously. They are the wave of the future, here and at utilities across the country. And they mean Aragon and the 55 or so meter readers employed by the utility will be doing something else.

By 2010, Colorado Springs Utilities plans to have its 500,000 gas, water and electric meters either retrofitted or replaced with equipment that will automatically transmit customers' energy usage to the billing department.

The first wave of the automated meters were installed recently in outlying areas, where the utility offers only selected services and where the cost of reading meters is higher. About 2,400 gas meters in Falcon and about 1,000 electric meters south on Colorado Highway 115 and west on U.S. Highway 24 in Ute Pass have been converted.

The utility also has conducted a pilot program in the city, installing automated water meters near Hancock Avenue.

Beginning in June or July, subcontractor Honeywell will begin installing 10,000 to 15,000 retrofitted gas and water meters and new electric meters each month, and those meters will begin transmitting billing data soon after.

The utility plans to install more than 100,000 meters a year until the city is completely automated. It also requires new developments to install the equipment so those homes and businesses don't have to be retrofitted. The equipment and technology is supplied by Georgia-based Cellnet.

The utility says there are good reasons to invest in the technology: safety and cost.

Last year, despite monthly safety seminars, the utility had almost 50 meter readers hurt, either by dog bites or slips and falls. Others over the years have been threatened by irate customers, and a few have had guns drawn on them. In fact, every month the utility asks police to escort meter readers to a few homes whose residents have been deemed dangerous.

"Almost every meter reader got injured (last year)," said John Smith, the utility's principal engineer for the automated meter project. "How many work forces do you have where every employee is injured?"

Aragon has never been injured on the job. But he said he's the exception.

"The hazards are unbelievable -- icy sidewalks, broken cinder block walkways, nails."

The automated meters, the utility has determined, will save utility customers money. Disbanding the meter reading department, with 75 readers and support personnel, will save an immediate $6 million a year, a cost that would grow through normal salary and benefit increases and workers' compensation cases.

Smith said the system also will reduce the costs of estimating bills for the 5 percent of meters that can't be read every month for one reason or another -- usually dogs in the yard -- and it will minimize the number of times trucks and crews must be dispatched to read problematic meters.

Because meters are read every day instead of once a month, the utility will be able to spot and deal with meter problems or energy theft quickly. The daily readings also could help the utility more accurately forecast how much energy it needs, Smith said.

The utility estimates the $80 million investment in automated meters, which have a life span of 20 to 25 years, will be paid off in 10 to 15 years.

The utility expects to absorb the meter readers and support staff into other jobs in the utility because of attrition and retirements.

Aragon hopes to stay with the utility. He understands the reasons to adapt 21st-century technology, but he's going to miss his brisk walks around the city, the people, even many of the chained-up dogs who enjoy a quick pat and rub.